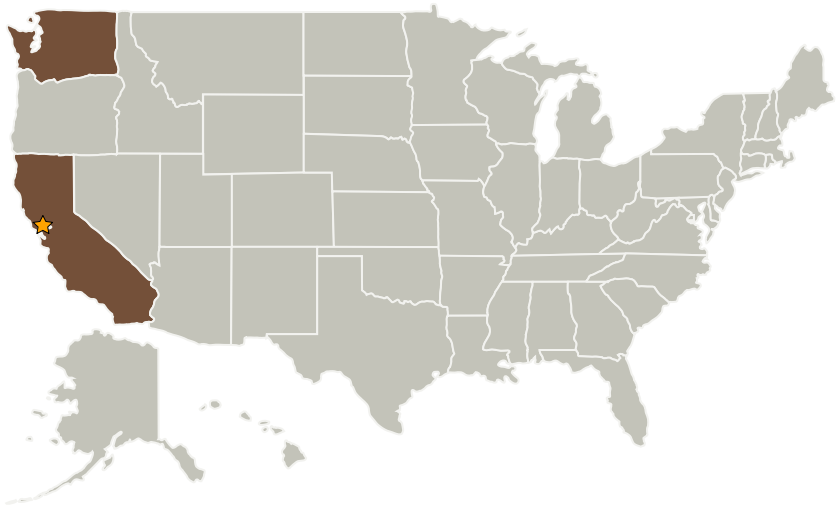
High Resolution Multispectral Flow Imaging of Cells with Extended Depth of Field, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

Proposed is the development the extended depth of field (EDF) or confocal like imaging capabilities of a breakthrough multispectral high resolution imaging flow cytometer. This platform shall have unparalleled cellular analysis capabilities intended to further biological space research (fundamental, micro-gravity and radiation biology) and the potential capability of monitoring astronaut health. The proposed platform shall simultaneously combine the high throughput analysis rates of flow cytometry, the high resolution imaging capabilities of multiple forms of high resolution microscopy (brightfield, darkfield and four fluorescent imaging channels) and the ability to image all cellular components in focus utilizing extended depth of field imaging. This cell observation platform shall find additional utility in NASA?s biology space research given Amnis? complimentary technologies, specifically: i) Amnis? in-suspension labeling techniques for staining cellular structures and probing specific molecules in the nucleus, cytoplasm and membrane including fluorescent in situ hybridization. These in-suspension techniques eliminate the time consuming manual glass microscope slide preparation of cells which is problematic for micro gravity environment, ii) Amnis? sample containment/injection pump operates similarly to NASA?s rotating wall culture vessel allowing cells to be continually suspended via a rotational axis perpendicular to gravity.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Amnis Corporation	Supporting Organization	Industry	Seattle, Washington

Primary U.S. Work Locations	
California	Washington

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

David A Basiji

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic